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## PHILOSOPHICAL HERESY

SYSTEMS of philosophy are the work of individuals. Even when a school is formed it prevails only in certain nations for a certain time, and unless the expression of dissent is suppressed by force, the dominant school even then is challenged by other schools no less plausible and sincere. Viewed from a sufficient distance, all systems of philosophy are seen to be personal, temperamental, accidental, and premature. They treat partial knowledge as if it were total knowledge: they take peripheral facts for central and typical facts: they confuse the grammar of human expression, in language, logic, or moral estimation, with the substantial structure of things. In a word, they are human heresies.

But if all philosophies are heresies, with what orthodoxy shall we contrast them? Evidently not with any philosophical or religious system, since it is just these systems that we are calling heretical. Much less with the collection of the critic's casual opinions. The more general the folly of mankind, the more likely is the critic himself to share it, especially as folly is a thing that folly is prone to impute. As the drunkard mutters, "you are drunk," so the philosopher scans the assemblage of his fellow-creatures and murmurs, "you are wrong." If we laugh at him for this, how shall we set up our personal opinions as a criterion by which the errors of mankind are to be judged?

The background of philosophical systems, the orthodoxy round which their heresies play, is no private or closed body of doctrine. It is merely the current imagination and good sense of mankind—something traditional, conventional, incoherent, and largely erroneous, like the assumptions of a man who has never reflected, yet something ingenuous, practically acceptable, fundamentally sound, and capable of correcting its own innocent errors. There is a knowledge which common life brings even to savages and which study, exploration, and the arts can clarify and make more precise; and this all men share in proportion to their competence and intelligence, no matter what philosophies or religions may fill their heads at the same time.

Heresies are systems that inherit all the claims of orthodoxy with only a part of its resources. In developing their chosen theme *à outrance,* they override the rest, though based on a quite similar authority. Heresy is thus no mere innocent error or native partiality, such as all natural beings are condemned to by their limited experience and faculties: it is rather an unnecessary error, a rebellious partisanship, a deliberate attachment to something the evidence against which is public and obvious; it is a sin against the light. This is none the less true because it is the excess of light at one point that produces and seems to justify this residual blindness. Philosophic systems are heretical because they abound in their own sense to the extent of denying or artificially transforming perfectly well-known matters, parts of that human orthodoxy to which they themselves must appeal for their foundations and for their plausibility.

The great misfortune of human orthodoxy is the natural apathy of reason. The beauty of truth is not great enough to attract the eye for its own sake. The truth is often ugly or terrible, and almost always less simple and unqualified than our love of eloquence would wish it to be. Discourse instinctively deviates from the truth, to set forth instead something more manageable, more rhythmical, more flattering. But the products of imagination sometimes strain it too much: the accumulated illusion suddenly collapses, and then for the first time we rub our eyes, and notice and express literally what we see and think. It is commonly at such times only that human orthodoxy makes much progress in articulation. A consequence of this is that its tenets are not arranged in an order appropriate to them or appropriate to their object. They do not form a logical hierarchy nor a clear natural history of the world. For they have not been reached by a gentle and continuous study of the truth, but rather by fits and starts, when some scandalous error exhausted people's patience and stung them into an eloquence and clearness they never knew before. Human orthodoxy is in its Apostolic Age; it has not yet had its Fathers or its Councils. Like early Christianity, it possesses instinct and tradition enough to exclude heresy after heresy as it arises, but it lacks a calm and adequate fund of doctrine that should not so much rebuke heresy as render heresy superfluous by solving beforehand the dark problems that provoke it.

Hence even when human orthodoxy has acquired a certain consistency, such that, for instance, an "Encyclopedia Britannica" can be compiled, older and collateral ideas have not disappeared. There are always at hand, for any meditative individual, a good many suggestions of experience which human orthodoxy has neither assimilated nor extirpated; and he may, if his genius so inclines, prefer one

of these unreclaimed or unreclaimable notions to orthodoxy as a whole, or he may try to combine it with a human orthodoxy modified or unhinged to suit it.

These backslidings, these reversions to the initial illogical wealth of the mind, produce various superstitious, mystical, or atavistic heresies. These mark the fact that, side by side with the waking life of reason, many animal illusions survive in the mind, many dramatic fancies and pre-rational habits of thought. Religious revelations and philosophies, when they do not express the deliverance of reason poetically, as they often do, but traverse reason altogether and undermine it mystically, belong to this atavistic class of heresies. They may run very deep, lifting the whole fabric of vulgar reason from its center, and reducing it to an illusion. We call them heresies restrospectively, in view of the orthodoxy we have achieved, but in themselves they are a forest of potential orthodoxies, elder rivals to that which public human life has accepted.

Another sort of heresy is peripheral and due to exclusive interest and confidence in some province of orthodoxy. This chosen part—sometimes the part last discovered—is taken for the key to the whole. Such heresy is sectarian. The scout assumes the rôle of the general. Excited by some little fact he has discerned, he shouts back his orders to the whole army, of whose extent and situation he has no notion. Hence the whole plague of little dogmatisms, that would harp universal harmonies on a single string. Yet these philosophies, being founded on the intent perception of something given and loved, are pretty sure to supply a true description, or at least an appropriate symbol, of that particular object. When neutralized by further knowledge and reduced to their proper scope and importance, these sects can contribute their special vista to the orthodox landscape: they can leave, as they retire, a sediment of science.

It would seem that a philosopher should not willingly be either mystical or sectarian. He will inevitably try to explain his mystical experience in the light of his clear knowledge, and so graft his favorite insights and bold hypotheses upon the stem of common sense. He will also wish not to be unfair to any element of the truth. Yet, as things stand, he can hardly remain a mere spokesman of human orthodoxy. That is a body of beliefs and appreciations far too chaotic to satisfy a reflective mind. Must, then, every philosopher, in proportion to the coherence and technical strength of his thought, be a heretic in spite of himself? Not inevitably. I think I see two ways in which philosophy might be achieved without heterodoxy. One is a very hard way indeed, that of comprehensive synthesis; a speculation so evenly inspired and broadly based that it should report the system or the medley of known things without twisting any of them.

Such a philosophy would be to human orthodoxy what the Fathers of the Church were to the Apostles, or the Doctors to the Fathers. This is a feat which no philosopher has accomplished, or is likely ever to succeed in. Those who have attempted it may have been the least deluded of philosophers, but they were also the least philosophical. They have not satisfied the critical mind almost at any point; they have recorded human opinion rather than mastered and deepened it, as a philosopher should. If, on the contrary, the pupil of common sense is masterful and systematic, he is sure to leave, in spite of himself, a large part of human orthodoxy out of account, and to become a sectarian. Aristotle, for instance, who is as normal a philosopher as possible, nevertheless upsets or ignores the whole of genuine physics —certainly half of human knowledge—in respect to which he is a humanist turned metaphysician, and casting the universe in the molds of grammar and ethics. Yet it is this heresy that gives his philosophy its character and its grandeur. A philosopher who was quite conventional and safe in every sphere of knowledge could hardly make such a great impression. He would bleat with the flock, and would be rightly regarded as an amateur in philosophy, like Cicero or Bacon. His eclecticism would remain incoherent, literary, and, as Nietzsche would say, human, all-too-human. Either way, therefore, there is little hope of reaching an orthodox philosophy by the synthetic method.

The other method by which I can imagine a man becoming a philosopher without being a heretic is far more modest, far easier, if only one has a temperament humble and skeptical enough. It lies in confessing that a system of philosophy is a personal work of art which gives a specious unity to some chance vista in the cosmic labyrinth. To confess this is to confess a notorious truth; yet it would be something novel if a philosopher should confess it, and should substitute the pursuit of sincerity for the pursuit of omniscience.

The first requisite of such a philosophy would be to renounce all claim to be a system of the universe. It would leave the theory of the universe to science, to human orthodoxy, or to religious revelation. It would concentrate all its attention or personal experience, personal perspectives, personal ideals. And in expressing these private views, it would not become heretical, or conflict in the least with human orthodoxy; for human orthodoxy does not ignore the fact that men have different sorts of imagination and emotion, that their affections and apprehensions are various, and that they do not approach even those points on which they agree by the same paths. A philosopher setting forth his cognitive and moral experience in his own way would, therefore, not be more heterodox than a poet with

an original vision, so long as he abstained from regarding so interesting an idiosyncrasy as the measure of all things.

Several great philosophers, like Socrates and Hume, have come very near to avoiding heresy after this fashion. But they have not quite avoided it, for they have assigned to their introspection a public value which it did not have, and have denied the validity of some of the sciences, or of all of them. Had they reported ingenuously what they perceived (as sometimes they affected to do), had the psychology of Hume not been malicious or the ethics of Socrates intolerant, all their profound radicalism might have left them orthodox. If given out for merely personal perspectives, all skepticism, all transcendentalism, all possible moral ideals, might be taken up into the life of reason. If the inevitable play and normal illusions of the senses continue to interest the artist without confusing his practical and scientific knowledge, why should the normal illusions of partial acquaintance with things, and the inevitable play of private interests, confuse a philosopher about the nature of the great world beyond?

I am well aware that this mode of avoiding heresy, by living in one's own house, while leaving the universe to manage its own affairs, is something repugnant to philosophers. They crave totality in their views and authority in their sentiments. Nevertheless, their views have no totality. They touch the hem of nature's garment, as science does; and if science feels some virtue pass into it at that contact, it can not fathom the source of that influence, nor map out the realities that may lie beyond. How should a complete chart of the universe descend into the twilight of an animal mind, served by quite special senses, swayed by profound passions, subject to the epidemic delusions of the race, and lost in the perhaps infinite world that bred it? And the moral sentiments of philosophers, however worthy of respect they may be for their sincerity or for their humanity (or in exceptional cases, for both) have no authority. Vehement as they may be, no other man's sentiment is obliged to conform to them. Their sense of value is a fact, it is a fact interesting to the historian, and fundamental in their own ethics; but in the life of nature it is a peripheral thing, a surface phenomenon, the expression of a profound subterranean ferment; and while nothing could be of greater moment in poetry or politics, nothing could be a worse or more heretical foundation for a system of physics, or even for a theory of human society.

If, however, by way of exception, a philosophical heresy could lose its venom and recognize that it was a myth, a graphic way of rendering and lighting up some group of facts or observations, lending them a certain specious unity and rhythm,—then the greatest incentive to envenomed heresy would be removed in minds of an

opposite cast. For heresy is often stimulated by the hatred of error, if not by the love of truth. It arises very largely by reaction against other heresies. A man sees how false another man's system is in some particular by which he himself happens to be otherwise impressed; and he hastens, in his hatred of error at that particular point, to construct a system contradicting his opponent there, while perhaps following him in everything else. But as the critic is conscious of being a purist in this one place, and exposing a fable, he never suspects that what he has not examined, but retained, and even what he has substituted, may be fabulous as well. Proud of being a radical, he can not imagine that he is a dupe. But if his opponent had presented his objectionable view as a personal impression, as the expression of a private experience by which the divergent experiences of other people were in no way denied or rebuked, the spur to lie for the pleasure of giving the lie to others would never prick him, and the self-expression of his own mind might proceed in sincerity, in peace, and in good humor.

Such are the hazards of human opinion and such the possibilities of an orthodox philosophy, as I conceive that human orthodoxy would itself represent them. There is, however, a well-known philosophy of philosophy that would discard all these distinctions. It would maintain that human thought was an absolute thing, that it existed and developed on its own internal principles and resources, without any environment. What this philosophy starts from and calls knowledge is, according to its description, not knowledge at all, but only absolute imagination, a self-generated experience expressing no prior existence and regarding no external object, either material or ideal. Such absolute imagination, since its development could not be affected by anything outside (there being nothing outside), would evidently require all those variations and ingredients which I have called heresies; they would all express its initial pregnancy more or less completely, and would be taken up and carried on in the next phase of its life. All the parts of orthodoxy might thus, in isolation, be called heretical, while the sum total and infinite life of heresy would be orthodoxy, or rather would be reality itself. We are in a world of romantic soliloquy, peopled by subjective lights and subjective assurances; and it is easy to see how well such a discovery might serve Protestant theologians to justify their past and idealize their future.

This assimilation of heresy and orthodoxy would be harmless enough if it confessed that it was merely the composition of an historical artist, the autobiography, as it were, of a groping speculation that likes to imagine itself to be the whole life and experience of a solitary god. An interesting cross vista of the world may be thus opened up, as by an egotistical poet; and if we are more interested in

ourselves than in things, we may well be delighted with such a synthesis of our experiences and of our preferences, as if these made up the sum of existence.

From this point of view, which some modern idealists identify with philosophic method, it is evident that Columbus brought America into existence by bringing it into consciousness, and that geography in general can not express the disposition of the earth's surface, but only the disposition or will of certain spirits to cultivate geography. Similarly, mathematics would lack an articulate and eternal subject-matter. It would not describe the essential relations of ideal terms, about which insight must always be insight and confusion confusion. No: it would rather, at each stage of its history, express the genius of a race, a state of society, and an individual, in expressing which no error is ever possible, since the will to square the circle can not misrepresent itself, but perfectly displays the vital impulse, singular and precious, of somebody in some place and at some moment. What superficial people call madness would thus have nothing wasteful and tragic about it. It would give the exact measure of life in one of its most intimate outflowings. If you rashly took the madness out of people, perhaps they might have nothing left that they could call their own. Nay, universal reason itself would have nothing to work upon.

This romantic philosophy of philosophy is itself a good instance of heresy, both mystical and sectarian. The idealist takes the subjective point of view because he likes it, because his doubts or his dogmas are in that way dissolved deliciously; and that is legitimate. He adds, however, that this subjective point of view is the only right and ultimate one, which is a sectarian heresy; and that it opens to him the substance and the plan of the universe, which is a heresy of the mystical and atavistic kind. As becomes a heretic, he is rather fierce about all this, and rather persistent; but in the long run he can not prevent the world from retaining its happy orthodoxy, and putting him and his private persuasions where they belong.

Indeed, the paradox that human thought is absolute, and therefore neither true nor false, neither orthodox nor heretical, is so extraordinary that many who call themselves idealists are far from maintaining it in its purity. They might practically admit what the unphilosophical imagine, that madness creates images that are personal, temporary, and useless; that geography studies an earth that existed before all geographers, and brought them forth; that mathematics describes ideal objects which are eternal and impersonal. All this they might admit under cover of the doctrine that the whole truth is already present to the mind of God, parts of the same being revealed to us *seriatim,* as our knowledge increases. Truth would

here be the logician's substitute for reality, and the mind of God the psychologist's substitute for the truth. The external standards of orthodoxy, under these idealistic names, would in either case be restored. We should need only to ask what this truth described, or what this mind of God thought about, to behold the natural, historical, and mathematical worlds reinstated, as every one instinctively believes them to subsist. Opinions would no longer have a share in the truth simply because they had a place in evolution. Madness would again be madness, error error, and heresy heresy. We should cease to hear of the absolute life of thought, in which everything was thoroughly significant and thoroughly pathological. Knowledge might really advance and accumulate, because there would be a world for it to discover, and progress might be real just because, in view of its fixed and natural goal, it would not be inevitable, constant, or endless. The naturalistic conception of what philosophy is and can be, of how it strays and how it is tested, would then be restored by general consent, as indeed it should be; for it is the plain deliverance of a long and general experience.

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## IS MATHEMATICAL CERTAINTY ABSOLUTE?

THE place where most people would look for absolute certainty is in pure mathematics or logic. Indeed, "mathematical certainty" has become a byword. Now, just as Aristides was ostracized because people were tired of hearing him called "The Just" so much, so we become somewhat suspicious of the absolute certainty of mathematics through hearing it continually dwelt upon. Is, then, mathematics absolutely certain? To answer this question we must first consider a few points concerning the nature of pure mathematics.

Pure mathematics (or logic, which is merely the same discipline under another name) is defined by Mr. Russell as "the science whose propositions contain no constants." That is, all the "things" about which logic and mathematics seem to assert specific propositions—the truth-values, universes of discourse, classes, syllogisms, etc., with which logic deals, and the numbers, integral, fractional, real, and complex which form the subject-matter of arithmetic and algebra, the points, lines, and planes of geometry, and the functions, definite integrals, etc., of analysis—are mere constructions, made to help us express and explain what certain sorts of propositions have in common, and not at all things of the real world. According to Professor Frege and Mr. Russell, a proposition such as "two plus two equals four" does not really involve such objects as two or four might be

supposed to be, but merely asserts that if one considers a property that belongs to a thing *a*, and another thing *b*, distinct from *a*, and to nothing else, and another property that belongs to a thing *c*, and another thing *d*, distinct from *c*, and to nothing else, then the property consisting of the disjunction of these two properties is possessed by objects which we may term *m*, *n*, *o*, and *p*, which are all distinct from one another, and if it be possessed by an object *x*, then *x* is either *m*, *n*, *o*, or *p*.

But even if the things with which mathematics deals are fictions, it must be admitted that we can handle these fictions without knowing how they are put together. The average mathematician neither knows, nor, I grieve to say, cares, what a number is. You may say if you like that his analysis is blunted and his work rendered unrigorous by this deficiency, but the fact remains that not only can he attain to a very great degree of comprehension of his subject, but he can make advances in it, and discover mathematical laws previously unknown. The whole logical analysis of the concept of number scarcely dates back forty years, yet the first mathematical use of numbers is lost in prehistoric antiquity.

Now, if mathematics is essentially the science of propositions involving no constants, how is it that there were mathematicians before Frege? How is it that mankind was able to handle the notion of number for myriads of years with hardly the ghost of an idea of what a number was? It is almost infinitely improbable, as one sees at once from the illustration given above, that we have Frege's notion of number before we study Frege's work, for it is so unfamiliar to us when we first learn it, and it can not be argued that since Frege's numbers have the formal properties of our every-day numbers they are identical with them, for a little reflection will convince us that on the basis of Frege's and Mr. Russell's own work, we can produce other constructions different from those to which they give the name of number, yet having formal properties which, as far as we are interested in them from the standpoint of a definition of number, are identical with those of Frege's numbers, and that it will be, in general, impossible to say that one of these constructions more truly represents the proper analysis of our naïve notion of number than another, for all of them will seem almost equally unfamiliar to us when we first become acquainted with them. With regard to the ordinary integers with which elementary arithmetic deals, for example, it is even impossible to say whether, in the strict mathematical sense of the word, they are ordinal or cardinal numbers—that is, whether or not they imply an arrangement of the collections of objects to which they refer.

We can not, then, regard naïve mathematics, whether it be the

naïve mathematics of a schoolboy or of a Leibniz, as merely a less explicit statement of what the modern analyst expresses with the aid of his involved technique and symbolism: whence, then, does it draw what certainty it possesses? Perhaps I can explain this best by reminding the reader of an experience which very many people must have had while they were learning mathematics. Every one, or almost every one, at any rate, must remember what agony his first lessons in geometry gave him when he was a schoolboy. The theorems seemed obvious enough to him, but how on earth, he probably wondered, can one get the theorems out of the axioms? No doubt, he thought to himself, two straight angles are always equal, but how is it that one is justified in proving it by superposing one on the other? The axioms did not tell him just when he could superpose one figure on another and when he could not. On the other hand, if he were to go by common sense, and not by his axioms, in proving his theorems, how did it happen, he must have puzzled, that he was not allowed to make use of such eminently sensible methods of proof as measuring the lengths of the lines occurring in his figures, determining the perimeter of a circle by rolling it along a straight line, etc.? After several months' practise in geometry, however, although he was still unable to give a formulation of the principles by which he worked which would satisfy the demand for rigor of the modern student of the axioms of geometry, he ceased to ask these questions, yet seldom went wrong in his geometrical reasonings. He used proofs involving superposition where, and only where, they led to valid results, and never tried to solve a problem by measuring his lines and angles, or by rolling a circle along a line. In short, although he was by no means able to analyze his geometrical proofs in detail, he had formed *habits* of handling the ideas of geometry which, as the time went on, became less and less likely to lead him astray. It was in the uniformity of these habits that all the certainty of his geometrical demonstrations lay—at any rate, until he had begun to correlate his geometry with arithmetic or logic—and the postulates and axioms of geometry served merely to help him fix these habits and render them uniform. As it was by no means impossible that these habits should have broken down in some particular instance—though, after he had studied geometry for years, it was extremely unlikely—the certainty of his geometrical demonstrations was not absolute.

Now, it is not merely in the schoolboy's study of geometry that habit plays a large part: the life of every branch of mathematics lies in a habit. Let us suppose the schoolboy of the previous example replaced by a practised mathematician, and the garbled collection of so-called "axioms" which form the introduction to most school geometries replaced by a genuine set of postulates, made as rigorous

as any yet devised. How is the mathematician ever to apply his postulates to one another? His postulates themselves can not tell him how they should be applied, for then he would have to make a proposition form a part of its own subject-matter, and he would be involved in vicious circle paradoxes. He can not solve the problem by merely adjoining new postulates to his set, telling us how to use the old ones, for either he has still the problem before him, how is he to use these new postulates, or he has an infinite regress of postulates, each depending for the rule by which it is to be applied on the preceding one. The only alternative which seems to me really open is that he should apply his postulates to one another in some way, the uniformity of which is secured by the fact that he has got the habit of handling certain sorts of combinations of symbols and of ideas in a certain manner. He feels instinctively, as it were, that here one can substitute this term for that, there one can leave off that parenthesis, etc. And this habit of using his symbols and compounding his ideas in such a way as to produce the results which other mathematicians have produced, and of obtaining new propositions in a certain determinate manner, is so ingrained in him and so uniform that the chances of his being led to deduce different and conflicting theorems from the same premises are very nearly *nil*.

Yet that these chances are not necessarily entirely absent is best shown by the fact that in many cases, where mathematicians had uniformly deduced certain conclusions from certain premises for, perhaps, centuries, great mathematicians have been able to change deliberately the habits with which they drew conclusions from these premises, and to deduce an absolutely different set of consequences from the original postulates, conflicting with the former conclusions, by bringing to expression as an additional postulate part of what was latent in the original habit, and contradicting it. This is the way the non-Euclidean geometries were first discovered, and the way that, after them, a whole family of systems such as finite spaces, non-Archimedean geometries, etc., have been constructed. This is the way negative numbers, fractions, irrational numbers, and complex numbers were first introduced. Now, although it perhaps never happened before the recognition of the axiom of parallels that a mathematician ever introduced a proposition only true in non-Euclidean geometry in a chain of reasonings about Euclidean geometry, it is by no means certain on *a priori* grounds that such a slip could not have occurred. Therefore, the demonstrations in geometry before the days of non-Euclidean geometry were only relatively certain.

Some of the mathematicians among my readers will object, in all probability, that our habits of geometrical reasoning are now absolutely determined, because the sets of postulates recently set up for

geometry are what is called *perfect* or *categorical*: that is, that any new postulate, involving no non-geometrical notions, adjoined to the set, would either be a consequence of the other propositions of the set, or would contradict them. This is perfectly true, as far as it goes, but to understand its implications we must ask, how does one prove it? and what does it mean? Now, the simplest of the modern ways of defining a system as geometrical is by expressing all the notions involved by it in terms of some fundamental relation, and stating certain limiting propositions about this. These defining propositions are of such a sort as to hold of all relations which are what is called *similar* to any given relation about which they hold. A set of defining propositions, or postulates is then perfect, if no proposition which will apply to any relation similar to $R$ if it applies to $R$, and which will still further limit the class of relations to which the set applies, can be asserted.

It will be seen, then, that to prove the perfectness of a set of postulates of, say, geometry, we already need a theory of relations, which will, among other things, explain the notion of similarity, and that the certainty of the perfectness of the set, on which depends our knowledge that our way of compounding the postulates of the set needs no habit to make it unambiguous, is itself dependent on the certainty of the formal calculus of relations. Moreover, if one deduces the theorems of the relational calculus directly or indirectly from certain premises, one can not claim, without aruging in a vicious circle, that he can prove that these premises form a perfect set, and that therefore our habits of using them can not be ambiguous.

Yet the theory of relations, like every mathematical theory, must be grounded either in postulates or in some other mathematical theory. The best foundation which has yet been given for it is that expounded in the "Principia Mathematica" of Dr. Whitehead and Mr. Russell. In this work, the theory of relations is deduced indirectly from certain postulates about propositions and "propositional functions" or concepts. The first postulate stated by Mr. Russell is very interesting in this connection: it says, "Any proposition implied by a true proposition is itself true." Unlike most of its successors, this is stated in words, and not in symbols. This fact is not without importance. Mr. Russell intends to use this proposition to justify himself in leaving off a true hypothesis from an implication. Now, if the proposition justifying this appeared in a tangible form as a premise in such a case, we should need to assume it a second time to justify its elimination in its first occurrence, and so on *in infinitum*. We should never, that is, be able to make a single deduction, for we could never separate a conclusion from its premises. We must be able to drop true premises in a definite manner, and this first

postulate of Mr. Russell's is expressed in words, and not in symbols in recognition of the fact that, while this is the case, our power of doing so resides, not in the formulæ of logic themselves, but in our habit of using them. Now it is not only possible, but highly probable, that there are habits in accordance with which we might deduce different results from Mr. Russell's postulates, and possible, but almost infinitely improbable, that we might at any time mistake one of these habits for the proper one. It seems also possible to me that this chance of uncertainty might be reduced to any desired degree by the insertion of new postulates in Mr. Russell's system defining the mode of application of the previous ones. The negation of these would lead to non-Russellian logics much as the negation of the postulate of parallels leads one to non-Euclidean geometries. It appears to me unlikely that such an amplification of Mr. Russell's set of postulates would ever render it possible for us to prove that no further ambiguities in the habits according to which we use these postulates would be possible.

Apparently, then, it is in any case highly probable that we can get no certainty that is absolute in the propositions of logic and mathematics, at any rate in those that derive their vadility from the postulates of logic. But are not the postulates themselves absolutely certain? Is there any conceivable room for uncertainty in the law of contradiction, or in the other axioms of logic? It appears to me that even here dogmatism is not the proper position to maintain. It seems a just maxim that we can not be absolutely sure that a proposition is true until we have a perfectly adequate knowledge of what it says—such a statement as, "Abracadabra, and I am sure of it" remains pure nonsense until one knows definitely what is meant by "Abracadabra," while even when we come to the relatively definite propositions of physics, such as the law of the conservation of energy, one of the chief sources of doubt as to their absolute validity is, in many cases, our lack of certainty as to what they really assert. Now, such "laws of thought" as the law of contradiction, or the law of identity, have already undergone a considerable change in their meaning on account of the analysis to which the new mathematical logic has subjected them—the law of contradiction, "Everything is either *A* or *not-A*," has been rendered a rather late inference in the "Principia Mathematica," limited in its meaning by the theory of types, and not derivable from any single one of the set of postulates there given. The law of identity has been shown to be a consequence of the definition of identity, which requires an elaborate logic for its very formulation. Even if one accepts "$p$ is true or false" as the same proposition as the law of contradiction and "$p$ is equivalent to $p$" as the law of identity, these may come in at a stage when the theory

of propositions has already reached a high level of development, if we accept Sheffer's analysis of the calculus of propositions, and it is by no means inconceivable that this should make a certain difference in their complete meanings. Moreover, it is not impossible that the notion of a "proposition," in the sense in which this word is used in the "Principia," may itself be capable of analysis in terms of some more simple notion—it is part of mathematical and logical progress not only that our sets of postulates should be rendered more precise by the adjunction of new postulates, but that the "habit" by which we use a set of postulates pertaining to a certain mathematical or logical system we use should be made more unambiguous by the reference of the system as a whole to a finer system, which gives us a smaller opportunity for ambiguity in the habit by which we use its postulates, as a center of orientation, as it were. There is no need, then, of supposing that even the axioms of the "Principia" or any similar set we shall ever come to are not subject to further analysis, and that we have an absolutely adequate knowledge of the meaning of any logical proposition whatever. Hence, although our degree of uncertainty in logic is so infinitesimal as not to enter at all in the allowance we make for error in our scientific reasonings, we have no reason to suppose it is altogether absent.

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## A STUDY OF AN IMAGERY TEST

IN Dr. Mabel Fernald's monograph, "The Diagnosis of Mental Imagery," the following test is described. Long words, such as somnambulist, symmetrical, etc., were pronounced to subjects who were then required to spell them backwards orally, and to report upon the process, noting especially any imagery which appeared to help in the performance of the task. The time taken to spell the word was noted on a stop-watch. Dr. Fernald writes:

"In general, we seem justified in saying that the results indicate that the rapidity of this form of spelling is favored by the ability to summon clear, vivid, and stable visual images of the words without a very great need for accessory factors. . . . We can not rely upon this as a purely objective test, since it would lead us into many errors of diagnosis. As a partially objective test, however, lending confirmation to the reports of the subjects, it would seem to be of greater value."

This test, though similar in principle to the Binet letter squares in which letters must be learned in a given position and then reproduced in some other designated order, and though it is also like the

Binet eight-year-old intelligence test which requires the subject to count backwards from twenty, has an advantage over these two. Fernald's test uses material which is already mastered in its original form, *i. e.*, the forward spelling of the word, and which is available in large quantities, so that the subject's reaction can be taken repeatedly. However, in a recent paper, Dr. Clara H. Town has called in question the validity of the test, on the basis of an experiment which she made upon six blind and six seeing persons. She says: "The tests in question have little or no value as objective tests for determining the use of visual imagery by a given individual."

A reliable diagnostic test of imagery seems to the present writer very important from a pedagogical point of view. A teacher needs to know the mental traits of the children with whom he deals, and children themselves may with profit be made aware of their own mental habits and of the changes which they might make in them. Hence it seemed worth while to gather more data on this test. I tried it with twenty-five adults and twenty-five children. The adults were all women, most of them college students between twenty and twenty-five years of age. The children were all girls between the ages of ten and twelve.

To adapt the test to these children shorter words were used than those in Fernald's list, and in order to cut down the rather large variations which she got, words of equal length were given. The first series consisted, then, of these fifteen words: *family, return, church, person, finger, pounds, handle, before, honest, figure, bundle, glance, always, pretty, custom.* Though these words are equal in length they proved to be somewhat variable in difficulty. The middle reading for the adults ranges from 4 seconds for the word *pretty* to 5.8 seconds for the word *church.* For the children the range lies between 6.4 seconds for *person* and 9.2 seconds for *custom.* The order of difficulty is not the same for adults and children, the correlation between the two orders being $+.36$. A second series was also tried, containing fifteen words of nine letters each, as follows: *following, constancy, treatment, carpenter, different, respected, fifteenth, gentleman, everybody, separated, intensity, merchants, sometimes, daughters, Wednesday.* In cases where the words were unfamiliar to the children certain substitutes were given. These were, *beautiful, contained, selection,* and *relations.* I have not computed the relative difficulty of these words, but they, like the short list, would undoubtedly show differences, and I think this test would be much improved by choosing words from a standardized list such as Ayres has now published in "A Measuring Scale for Ability in Spelling."

At the beginning of each test the subject spelled a few preliminary words backwards and was questioned as to how she went about the task. The attempt was made to elicit spontaneous and circumstantial comments upon the imagery, and to avoid suggesting particular kinds of imagery. The reliability of the children's reports may seem especially open to question. My plan was, from my previous knowledge of these children and from preliminary questioning, to hazard a guess as to the child's imagery, and then to see whether she would make a statement and hold to it in the face of a contrary suggestion. This I found that they would often do. For example, to one whom I believed to have little visual imagery I said, "Do you seem to see the word?" She said "No I don't see it at all; I think it." "Don't you see it as if it were written or printed out?" "No, I just think it—like a voice." If I made a wrong guess and the child agreed with my suggestion, I then tried to get some detail about the image which should seem to mark it as genuine. For instance, I asked one child about her sound images, whose voice they were like. She answered, "Why it's a mixture of mother's voice and mine." Answers like that I take to be genuine. Judging, then, partly by the child's assured statement, partly by the spontaneity and naïveté of the statement, and partly by incidental signs, as when I heard the whispered spelling of the word forwards, or saw the child writing in the air with her hand, I felt some confidence in the accuracy of the children's introspections.

The kinds of imagery noted are designated as follows:

*Vis. whole.* Some persons were able to apprehend the word as a whole picture, and to spell it off as if reading the letters backwards from a printed page. They were not aware of depending on other cues.

*Vis. part.* Subjects reported fragmentary visual imagery of words. Sometimes it appeared syllable by syllable, sometimes in arbitrary groups, occasionally even letter by letter. Under this rubric are included those, also, who used visual imagery, but who did not see the word certainly as a whole.

*Mixed.* Those subjects are here counted as mixed in type, *a*, who use some visual images, but who change cues from word to word, *b*, who for each word use a combination of cues including the visual. Among them are certain cases in which the subject depends upon a visual image, but finds it necessary to pronounce the word in order to summon the picture.

*Doubtful.* Cases in which the subject could give no conclusive account, and cases in which I could not be sure that she was not influenced by the form of my question, are recorded as *d*.

*Aud.* and *art.* refer to those who used characteristically auditory or articulatory images.

*Gr. mot.* means grapho-motor, and the class *non-vis.* is used to cover the cases in which the subject could not specify her method further than by saying that it was certainly not visual. This term is not, therefore, exclusive of auditory, articulatory, etc., cases.

The distribution of the subjects among these imagery classes is as follows in Table I.

TABLE I

| | | Vis. Whole | Vis. Part | Mixed | D. | Aud. | Art. | Gr. Mot. | Non-vis. |
|---|---|---|---|---|---|---|---|---|---|
| Short words. | Adults..... | 8 | 4 | 7 | 0 | 0 | 2 | 0 | 4 |
| | Children. | 5 | 4 | 3 | 3 | 2 | 6 | 1 | 1 |
| Long words. | Adults..... | 4 | 5 | 5 | 6 | 0 | 2 | 0 | 3 |
| | Children. | 2 | 2 | 3 | 5 | 2 | 5 | 1 | 1 |

The distribution of subjects according to speed is given in Table II. The time was noted on a stop-watch. The median of the fifteen reactions gives the subject her rank. Thus the number 9, Table II., means that there were nine adults whose median reactions took from three seconds up to (but exclusive of) four seconds.

TABLE II

| Time | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | ... | 22 | 23 | ... | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ad... | 0 | 9 | 7 | 4 | 2 | 2 | 1 | 0 | 0 | 0 | | | | | | | | | | | | | |
| Ch... | 0 | 0 | 1 | 1 | 4 | 5 | 5 | 4 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | ..... | ..... | 1 | | |
| Ad... | 0 | 0 | 0 | 3 | 5 | 4 | 4 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 3 | | | | | | | | |
| Ch... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 3 | 5 | 0 | 2 | 2 | 0 | 3 | 0 | 1 | ..... | 1 | ..... | ..... | 1 |

The children here show a normal distribution, whereas the curve for the adults is skewed to the left in the short series. Reference to the preceding table shows that whereas the visual and the non-visual methods are fairly evenly distributed among the children, the visual methods clearly outweigh the non-visual among the adults. In other words the visual image seems to go with the better speed. The factor of age might account for the absolute differences in speed, but it can not with certainty be made to account for the form of the distribution.

Table III. gives the median in seconds with its probable error for each subject, the type of imagery characteristic of the subject in this test, and the number of errors for the whole series. Table III. gives the records for the short words, Table IV. for the long words.

TABLE III

| Adults | | | | | Children | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Subject | M | P. E. | Imagery | Errors | Subject | M | P. E. | Imagery | Errors |
| 1 | 3 | .6 | vis. whole | 0 | 1 | 4 | 1.2 | vis. whole | 0 |
| 2 | 3 | .8 | vis. whole | 5 | 2 | 5 | 1 | mixed | 0 |
| 3 | 3.2 | .4 | vis. whole | 0 | 3 | 6 | 1 | aud. | 3 |
| 4 | 3.2 | .6 | art. | 0 | 4 | 6 | 1 | vis. whole | 1 |
| 5 | 3.4 | .4 | vis. whole | 0 | 5 | 6.4 | 1.4 | art. | 0 |
| 6 | 3.6 | .4 | non-vis. | 0 | 6 | 6.4 | 1.4 | vis. whole | 1 |
| 7 | 3.6 | .6 | vis. whole | 0 | 7 | 7 | 1 | d. | 3 |
| 8 | 3.8 | .6 | vis. whole | 2 | 8 | 7 | 1.2 | art. | 3 |
| 9 | 3.8 | .6 | mixed | 0 | 9 | 7 | 1.3 | vis. whole | 0 |
| 10 | 4 | .6 | mixed | 2 | 10 | 7.2 | 2 | non-vis. | 0 |
| 11 | 4.2 | .6 | vis. whole | 0 | 11 | 7.6 | 1.2 | vis. part | 2 |
| 12 | 4.4 | .8 | non-vis. | 1 | 12 | 8 | 1.2 | vis. whole | 2 |
| 13 | 4.6 | .6 | mixed | 1 | 13 | 8 | 1.4 | mixed | 3 |
| 14 | 4.8 | .6 | mixed | 0 | 14 | 8 | 2.4 | d. | 0 |
| 15 | 4.8 | .8 | vis. whole | 0 | 15 | 8.2 | 3 | vis. part | 5 |
| 16 | 4.8 | .8 | vis. part | 2 | 16 | 8.6 | 2.4 | d. | 0 |
| 17 | 5 | .4 | mixed | 0 | 17 | 9 | 1.4 | vis. part | 1 |
| 18 | 5.2 | 1.2 | mixed | 2 | 18 | 9.2 | .2 | art. | 3 |
| 19 | 5.4 | .6 | vis. part | 1 | 19 | 9.2 | 3.2 | art. | 7 |
| 20 | 5.6 | .6 | vis. part | 2 | 20 | 9.4 | 2 | vis. part | 1 |
| 21 | 6.4 | 1.4 | mixed | 1 | 21 | 10 | 1 | gr. mot. | 1 |
| 22 | 6.6 | 1.2 | non-vis. | 2 | 22 | 10 | 1.6 | art. | 1 |
| 23 | 7 | .6 | vis. part | 1 | 23 | 12 | 2.6 | aud. | 5 |
| 24 | 7 | 1 | art. | 1 | 24 | 15.8 | 2 | art. | 1 |
| 25 | 8.2 | 2.4 | non-vis. | 7 | 25 | 23.4 | 12.6 | mixed | 11 |

TABLE IV

| Adults | | | | | Children | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Subject | M | P. E. | Imagery | Errors | Subject | M | P. E. | Imagery | Errors |
| 1 | 5.4 | .6 | vis. whole | 1 | 6 | 10.2 | 1.2 | vis. whole | 3 |
| 6 | 5.6 | .6 | non-vis. | 2 | 1 | 10.6 | 4 | vis. whole | 0 |
| 5 | 5.8 | .8 | vis. whole | 0 | 2 | 11 | 3.2 | mixed. | 1 |
| 7 | 6 | .6 | d. | 1 | 11 | 11.2 | 2.4 | d. | 2 |
| 9 | 6 | 1.4 | mixed | 0 | 5 | 11.8 | 2.2 | art. | 1 |
| 4 | 6.4 | .8 | art. | 1 | 7 | 12 | 1.4 | mixed | 0 |
| 8 | 6.4 | .8 | vis. whole | 5 | 3 | 12 | 1.4 | aud. | 0 |
| 3 | 6.6 | 1.4 | vis. part | 1 | 9 | 12.2 | 1.4 | vis. part | 0 |
| 11 | 7 | 1 | vis. part | 0 | 10 | 12.2 | 2.8 | non-vis. | 5 |
| 15 | 7 | 1.2 | vis. whole | 0 | 16 | 12.6 | 2 | d. | 1 |
| 2 | 7 | 1.4 | mixed | 5 | 4 | 14.2 | 3.4 | vis. part | 0 |
| 10 | 7 | 1.8 | mixed | 0 | 14 | 14.4 | 4 | d. | 3 |
| 12 | 8 | 1.2 | d. | 1 | 18 | 15 | 1.6 | art. | 1 |
| 14 | 8 | 1.8 | mixed | 2 | 8 | 15 | 3 | art. | 2 |
| 16 | 8.6 | 1.4 | vis. part | 0 | 21 | 17 | 2 | gr. mot. | 0 |
| 17 | 8.8 | 1.4 | mixed | 1 | 23 | 17.2 | 2.8 | aud. | 3 |
| 19 | 9.6 | 1 | vis. part | 3 | 22 | 17.4 | 4 | art. | 5 |
| 13 | 9.8 | 1.8 | vis. part | 3 | 20 | 19 | 2.8 | mixed | 5 |
| 21 | 11 | 3 | d. | 3 | 15 | 22.2 | 5.2 | d. | 7 |
| 20 | 11 | 3.6 | d. | 3 | 24 | 31.6 | 7.6 | art. | 4 |
| 18 | 13 | 3.2 | d. | 3 | 17 | 31.8 | 12.4 | d. | 2 |
| 24 | 13.2 | 2.6 | art. | 0 | | | | | |
| 22 | 16 | 1.8 | non-vis. | 2 | | | | | |
| 23 | 16 | 3.6 | d. | 3 | | | | | |
| 25 | 16.4 | 5.4 | non-vis. | 5 | | | | | |

From these tables it appears that with short words the middle reading for adults who use whole visual images is 3.5 seconds; P.E. .4; for those who use other forms (treating them as one class) 5 seconds P.E. 1. For children who use whole visual images the figures are 6.4 seconds, P.E. .6, and for the others 8.4 P.E. 1.3.

The long words give for the adults, vis. whole 6.1, P.E. .5, others, 8.6, P.E. 2.2. For children vis. whole 10.4, P.E. 4; and others 15, P.E. 2.8.

The average errors are, with short words, for adults vis. whole .8; others 1.35; for children vis. whole .8; others 2.5. With long words, adults, vis. whole 1.5; others 1.8. Children vis. whole 1.5; others 2.2. Thus there is an advantage throughout in favor of the vis. whole group. Those who use fragmentary visual imagery seem to be no better off than the non-visualizers.

*The Effect of Practise.* The medians of the first five, the middle five, and the last five reactions were noted for each subject. The result is that no clear practise effect is discernible. Of the adults in the short series 10 grew worse, 4 remained the same, and 11 grew slightly better. Of the children 18 grew slightly worse, 2 remained the same, and 5 improved slightly. In the long series 12 adults improved and 13 deteriorated, 10 children improved and 11 deteriorated. The changes were slight and in general are smaller than the probable error. This result speaks in favor of the usefulness of the test, as it is not likely to be vitiated by the fact that many children play games or use codes in which spelling backwards is a feature.

*Conclusion.* It is desirable that the test be tried with more subjects, including men and boys, and also with a list of more perfectly standardized words. The present results seem to me to support Dr. Fernald's estimate of the test as quoted above. Dr. Town's method may account for the difference in her results. In her report she uses "seeing subjects" as the equivalent of "visualizers." The assumption that all seeing persons use visual imagery in a test like this is entirely unwarranted, and it makes Dr. Town's results quite meaningless, it seems to me, so far as the imagery problem is concerned. It should be said, finally, that although this test may prove to be a useful accessory in classifying persons according to their imagery, yet it does not indicate that a person belongs to such and such a general imagery type. In other words a person may be a visualizer in the kind of performance which the test represents, but may be something different in other enterprises.

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## REVIEWS AND ABSTRACTS OF LITERATURE

*The Philosophy of Giambattista Vico.* BENEDETTO CROCE. Tr. R. B. Collingwood. New York: The Macmillan Company. 1913. Pp. xii + 317.

The effort of Croce to create a place for Vico in the history of philosophy can be understood on two grounds: a patriotic devotion to Italian culture and the feeling of a certain like-mindedness whereby Croce sees in Vico a forerunner of his own thought. But the way of the patriot is hard, for, in his own day "at most, Vico acquired the reputation of a scholar amongst hundreds of scholars, a man of letters among thousands of similar men; a learned man but nothing more" (p. 261), and in spite of Croce's best efforts to find traces of his thought in later centuries the results are most meager. On the other hand, the like-mindedness between Croce and Vico is real, often in defects as well as in merits. Both lack the architectonic sense that makes constructive exposition possible and both indulge in a loose use of terms that is the despair of an exact student. Yet both exhibit a certain acuteness of large-scale vision that makes their thought, after all, worth while.

Croce's exposition "is not meant for a summary of Vico's writings work by work and part by part" (p. vii). It is rather an evaluation of Vico's thought and might well be entitled, after the analogy of one of Croce's other writings, "The Truth in Vico."

The first two chapters are devoted to the theory of knowledge. This theory arose in direct opposition to Carthesianism. Clear and distinct perception is not the criterion of truth, but rather "the condition under which a thing can be known is that the knower should have made it, that the true is identical with the created: *verum ipsum factum*" (p. 5), from which it follows that God alone possesses science, man only consciousness; and metaphysics, theology, and physics are depreciated. Most striking is the limitation imposed upon mathematics by this point of view." From metaphysics, geometry takes the point by drawing it, that is, by annihilating it as a point, and arithmetic the unit by multiplying it, that is, by destroying it *quâ* unit. But since metaphysical truth, however certain it may seem to consciousness, is indemonstrable, mathematics itself rests in the last resort upon authority and probability" (p. 12). Therefore, mathematics as derived from metaphysics, can not be a basis of other sciences, although they follow it in order of derivation. From this we are led to the astounding conclusions that science has never made any discoveries through the mathematical method, while without it all goes well.

However, Catholic faith, acquaintance with the moral sciences, and the study of law worked together to lead Vico to modify these conclusions on the basis of his theory of knowledge. Man can know his social world because he has made that world. But in mathematics, as in moral science, it is a question of dealing with man's own creations, of placing facts in ideal constructions, and the mathematical method is reinstated as

a method of value to morality. In Vico's hands, however, facts suffer under the method of ideal construction, and for the rest of his philosophy we find gaps filled with pseudo-facts established by "metaphysical proofs," or uncertainties made certainties because of mere conformity to some assumed principle, to an extent that greatly detracts from our appreciation of the *New Science*.

Croce is at great pains to prepare his reader for the defective character of this work, with its violence to facts and confusions of philosophic, scientific, and historic methods (p. 42). The faults, he tells us, are those "often found in highly original and inventive intellects, which seldom work out their discoveries in accurate detail, while less inventive minds are generally more precise and logical," a romantic touch which the history of philosophy hardly bears out, however true it may be in literature. As a canon of interpretation necessitated by Vico's "tendency to confusion or his confusion of tendencies (!)," Croce proposes the analytic separation of his philosophy from the other elements with which it is bound up, a task, however, that proves somewhat baffling even to our author's great learning and skill.

The last two chapters of the book deal with Vico in relation to later thought, but, quite properly, the main part is devoted to the social philosophy of which the most striking characteristic and the one that most nearly raises Vico above the level of his age is the conception of society as a growth rather than an invention. In mind we have a process of unfolding, through which the feelings and instincts of brutish men become transformed into the nature of civilized human beings in whose common consciousness of necessities and utilities lies the germs of morality, and in the weakness of whose understanding, the germs of religion. This growing society is then traced somewhat confusedly through the stages of its development under the law of reflux by which civilization comes to an end in the "barbarism of reflection" which is infinitely worse than the "barbarism of sensation" from which it has emerged, and which can only be cured by the dulling of "the evil subtlety of malicious intellect" through long centuries of a new barbarism of sensation, a process strongly suggestive of the Hegelian formula, but, in execution, lacking in disciplined analysis.

There are four appendices dealing with the life and character of Vico, the later history of his thought, the sources of this theory of knowledge, and bibliographical material. In the third of these, Croce defends Vico's originality and replies to certain criticisms, as to his own personal bias and his idealistic interpretation of the Catholic Vico, which had already been made to the Italian edition of his book. Mr. Collingwood's translation is uniformly excellent, indeed, one almost completely loses the sensation that he is reading a translation and not an original work.

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## JOURNALS AND NEW BOOKS

THE BRITISH JOURNAL OF PSYCHOLOGY. March, 1915. *Perseveration* (pp. 387–419): W. LANKES. – The object of the investigation was to contribute something to the questions: (1) Is perseveration a general factor—comparable with general ability, influencing the entire range of mental activity, and therefore of prime importance for a correct conception of the constitution and operation of the human mind? (2) How is perseveration as a peculiarity of the cognitive side of mental life, related to the "perseveration"—qualities of character, *i. e.*, perseverance or persistency of will? The experiments included (1) natural rate of tapping, (2) letter-writing, (3) cancellation, (4) color-disk rotating, (5) drawings, (6) narratives, (7) associative reaction, (8) essays and an interrogatory on perseveration-tendency and estimates of "persistence" qualities of character. All the tests correlate slightly positively among themselves and with the interrogatory. The correlations must be the result of a general factor influencing all the various performances tested by the experiments and by the interrogatory. Perseveration may be claimed as this one common factor. This perseveration does not correlate or correlates negatively with the estimates of "perseveration" qualities of character. The reason given is: perseveration, as tested, "is a native quality of the nervous system, innately different with different individuals. The perseveration or persistence tested by the estimates of qualities of character and behavior is the result, not of nature and the native system alone, but of that and the individual's own effort and will. The absence of correlation between the two *p's* proves the independence of innate perseveration and will, and the slightly negative correlations tend to show that the self, with persons used to act morally . . . can modify, and directly counteract, its own nervous system and its innate tendency towards perseveration or the opposite." *The Formation of Projected Visual Images by Intermittent Retinal Stimulation. I. General Characteristics of the Image* (pp. 420–433): GEORGE H. MILES. – After images gradually fade, but if light is allowed to fall intermittently at a suitable rate on the closed eyelids or if the intensity of the illumination of the screen on which the image is projected be varied at a regular rate, the fading and indistinct image is rapidly revived. Experiments have been made to discover the main factors involved in the production of the projected image. "The 'projected image' noticed on first directing the eyes to an illuminated surface, appears to owe its revival to the restimulation of previously excited tracts and is also influenced by the excitation of the remainder of the retina and more particularly by the parts bordering on the previously excited area." In normal conditions the image always follows the voluntary movement of the eye; whereas when the eyeball is displaced by pressure, the image occupies a position which appears located by voluntarily determined direction of attention. *Simultaneous and Successive Association* (pp. 434–452): A. WOHLGEMUTH. – The experiments were performed to decide between the claims of the rival theories of simultaneous and successive association. The conclusions are made with reference to the psychological memory only: (1) The more

the members of a group are apperceived as a whole the stronger their association with one another. (2) The theory that the formation of associations is due to the succession of experiences *quâ* succession is not correct. (3) All associations are due to simultaneity, either simultaneity of the experiences, or simultaneity of the succeeding experience with the akoluthic phase of the preceding experience. (4) The simultaneous experience is more favorable for the learning of pairs than the successive experience. (5) In learning pairs no cross-examinations between members of adjacent pairs are formed. *Factors in the Mental Processes of School Children. I. Visual and Auditory Imagery* (pp. 453–490): N. CAREY. – The material used in the research was (1) verbal memory tests, (2) tests of sensory discrimination, (3) tests of sensory memory, (4) tests of general ability, (5) tests designed to involve the use of imagery, (6) estimates of visual and auditory ability from introspections, (7) estimates of scholastic ability according to the results of school examinations, (8) ranks of children according to scholastic intelligence, practical intelligence, painstaking and social status, drawn up by teachers of the school. "The correlations between the different types of imagery are comparatively high; higher than those of imagery with any other performance." Although the "results can not prove that mental activity may take place without visual and auditory imagery, yet they do prove that the clearness of such imagery bears no relation to the effectiveness of the mental processes which it accompanies. It might be argued that the usefulness of imagery depends upon its mere presence. This, however, seems improbable. It is not usual to find that imperfect tools serve so useful a purpose as perfect ones." *Publications recently received. Proceedings of the British Psychological Society.*

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## NOTES AND NEWS

THROUGH the courtesy of the editors of *The New Republic*[1] we are permitted to reprint the following correspondence.

### POLITICAL PHILOSOPHY IN GERMANY

Sir: In his book on "German Philosophy and Politics," Professor Dewey has proposed an original view of what is wrong with the philosophy of the government responsible for the present war. It has been commonly felt that on Germany's part this war has a philosophy behind it, and a bad one. Many of us have been supposing that this philosophy stood in strong contrast with the idealism with which Germany began the nineteenth century. During the time when the present policies of the German government were shaping themselves, the prevalent state of mind was openly hostile to these idealistic teachings, and Germany was listening to leaders who learned far more directly from scientific experience and from the bitter examples of successful statecraft that were at hand, especially in English practise. We thought that Germany had learned these lessons only too well, and with native thoroughness had carried them to extremes at which we, who had in some measure been practising them, were forced to abhor them. As opposed to that early idealism, this philosophy was one which justified expediency as against principle; which had cured the German spirit of the weakness of sympathy and humanity; which had freed itself from the idea of absolute obligation toward treaties or elsewhere, and had become efficiently Darwinian and pragmatic.

In Professor Dewey's eyes we have been making a mistake, and a serious one. The trouble with Germany, he finds, is not in the rejection of its idealists, but in the vestige of their doctrines that it still retains. It is Kant in particular who has misled Germany, by giving a philosophic sanction to a certain native hypocrisy in the national blood which disposes it to revel in the inner flattery of idealistic sentiment while doing what it pleases in the outer world of hard facts. This was not quite foreseen or intended by Kant; but he had set up an absolute principle of duty, so formal and spectral that it could not be said to command anything in particular, and yet one which spurned instruction from experience. Such an absolute law, like the swept and empty house of Scripture, was open to occupancy by any usurping devil; and so Scharnhorst, Hegel, Bernhardi and others trooped in, setting up in the vacant sanctuary "the good of the State" as a concrete object of supreme devotion. Thus the nation has come to use the name and inner unction of the idealist's absolute duty to support the principles of Machiavelli, Frederick, and Bismarck. This result is persuasive to the German mind chiefly because the German mind is disposed to have its absolute; abandon this "traffic in absolute," and the supreme good of the German state fails to impose on belief as an ultimate end; it becomes an end to be tested, like all others, in the crucible of experience. It must break down at last before the higher good, "furtherance of the depth and width of human intercourse." This, as I read it, is Professor Dewey's diagnosis of the German distemper.

[1] See *The New Republic*, Vol. IV., pages 234 ff.

He therefore recommends to American policy a more radical experimentalism; let us have done with absolute or fixed principles, such as "nationality" or "sacred rights"; let us regard everything as subject to test, discussion, measurement, compromise, adjustment, revision. Of course, while we are trying a theory out, we try it as if it were, for the time, worthy of complete confidence, and to become "established," for that is what giving a trial means. And we are forced to inquire whether the German government is not at the present moment faithfully following the experimental prescription: it is trying its own theories to see how they work. It believes firmly that its methods are the methods that succeed; and it believes so not because of anything that Kant taught, but because of the way in which it has recently been interpreting history, led by its series of economic historians from Marx (who precisely inverted Hegel's view of history) to Lamprecht and Schmoller. Perhaps official Germany still expects to find these principles confirmed by a successful issue of the war, and if such should be the case, would Professor Dewey have any argument from the armory of the experimental philosophy against them, as principles suitable for Germans? He might urge that what in such an event would work very well for the victors would work very badly for the victims; and unless a principle works all around, it can not fairly be said to work. But this is exactly the test that Kant uses; it is, in fact, his "absolute law": any maxim, said he, that can be made universal is a good one, any other is a bad one. This law does not indeed prescribe any specific line of conduct; but, as the present instance shows, it would be highly inaccurate to infer that it is of no effect in guiding concrete action, or in distinguishing between a good course and a bad one. Germany's course might be defined as experimentalism without the Kantian corrective.

Upon close scrutiny of Professor Dewey's argument, however, the substance of his criticism seems to be, not that Germany has an absolute, but that it has the wrong absolute. Has he himself done more than to transfer the putative crown of the absolute moral end from "the good of the German state" to "the furtherance of human intercourse"? If it were true that Germany to-day believes in an absolute duty, the trouble would be, on Professor Dewey's showing, only that it gives this absolute too narrow a definition. But this is an error which can certainly find no sanction in the Kantian philosophy. For Kant did in fact try to fill his formally empty house with a maxim identical in effect with that which Dewey proposes: "Treat humanity as an end in itself, and never as a means only." Can any one with the slightest historical justice credit the German government of to-day with following *this* Kantian principle? If this were taken by the government as an absolute of inflexible rule, would there have been any war? And would Professor Dewey have had anything to criticize?

The fact of the matter seems to be that the ruling party in Germany does not at heart believe in any absolute duty. It is radically experimental or pragmatic, which is what *Realpolitik* essentially means. It does indeed go about its work as desperate action always does, with relentless dogmatism and a liberal invocation of the name of God. It flourishes an

absolute: but this absolute is not even verbally of Kantian origin—it has its roots in the ancient piety of Germany, transferred to the historically un-German doctrine of the divinity of the monarch and of the state. But assuming for the moment that this appeal to absolute right had a sidelong reference to Kant or Hegel, is anyone outside of Germany convinced by it that the German government believes in its own language, or is actuated by any idealistic faith? What most of us seem to feel here is rather a discrepancy between the profession and the actual belief exemplified in behavior, a mental dishonesty which can neither be traced to Kant's philosophy nor attributed to the normal character of the German people. And surely we can not fairly judge the character of any philosophy by those who cloak themselves in its phrases without a shadow of faith in its substance.

The issue raised by Professor Dewey is not a slight one. It involves not only the good name of German idealism—which with all its strut and abstraction is worth defense, for we must allow Germany what spiritual asset she still has—it involves also our own American political thinking. The American people is becoming conscious of its need for a political philosophy which expresses its character. Largely through this war the conviction has become strong within us that we have a distinct character, and something to stand for. When Mr. H. G. Wells made the tour of America whose results were published in "The Future of America," he failed to find any such conviction; he said we were "state-blind." This condition of things has come to an end. We have a political character, and are conscious of it. Is it expressed in the philosophy of experimentalism? Our national protests against submarine outrages have been based throughout on the ground of rights that are assumed stable. Experimentalism at this point would rob our national attitude of what punch it has. We need not, and do not, assume in these documents that we know in detail what is absolutely right and good; but we are bound to believe that there is such a thing as principle and right, and that there are certain rules which come so close to embodying it, in the existing cases, that we shall put an inflexible will behind them. They have been experimented with during all previous history, and they have been experimented with enough. We do not propose to experiment further with slavery, nor yet with our main positions upon the "rights of man," though we have much work to do in defining those rights. There can be no doubt that our own experiment in government suffered from an overdose of absolute *a priori* theorems borrowed from England and France (surely not from Germany) in the framing of our constitution. It will take time, as Professor Dewey declares, to weed out this mass and determine what things they are to which we shall hold fast. Here an experimental temper will help us on. It is always easy to be absolute about too much, and the critic of the absolutist is always needful. But this is a far cry from the rejection of all absolutes—that is, of all fixed principle. I should prefer to accept the other side of Professor Dewey's faith, and adopt "the furtherance of human intercourse" as a good beginning toward defining an absolute end.

CAMBRIDGE, MASS. WILLIAM ERNEST HOCKING.

IN REPLY

Sir: The correctness of my account of the historic development of the German temper of mind is of limited interest compared with the other question which Professor Hocking raises—a question which, as he truly says, concerns our own American political thinking. Shall our political philosophy be experimental, or shall it be *a priori* and absolutistic? My book on "German Philosophy and Politics" was certainly addressed to American, not German readers; it was animated by the hope that it might do something, however slight, to make Americans conscious of the discrepancy which exists between the tenor of our activity and our current theory and phraseology about that activity. To make a specific application, I do not feel easy when I find that, say, the divergence between President Wilson and Mr. Bryan as to the methods of dealing with the present international situation rests upon a common assumption of "immutable principles," waiting ready-made to be fastened upon the situation; the divergence being that Mr. Wilson, as a lawyer, finds them already embodied in a legal code, and Mr. Bryan, as a sentimental moralist, finds them embodied in the great heart-throbs of an altruistic humanity. I can but think that we should be better off if we had recognized from the beginning that the question was to find out what we really wanted, and what the moving forces of the situation permitted, and how to go intelligently about getting the ends decided, after due deliberation, to be desirable.

But Professor Hocking disagrees. He finds that the matter with us is that we have been too pragmatic, too empirical and experimental, and that the conduct of Germany is an object lesson to us of what that sort of a philosophy leads to; a warning, presumably, to return to some absolute and eternal code—just whose, however, he fails to tell us. And so it appears that the accuracy of my statement of Germany's mental diathesis is relevant to the issue between us. For Professor Hocking has not grasped my position. I have not said that the behavior of the rulers of Germany was dictated by an idealistic philosophy. I meant (and said) that it was a *Realpolitik*—highly pragmatic if you please. Of course it is; all action as action is pragmatic. But the prevalence of an idealistic philosophy full of talk of Duty, Will, and Ultimate Ideas and Ideals, and of the indwelling of the Absolute in German history for the redeeming of humanity, has disguised from the mass of the German people, upon whose support the policy of the leaders ultimately depends for success, the real nature of the enterprise in which they are engaged. Does Professor Hocking believe that the German people are supporting the war because *they* think it is a measure of "practical expediency"? If so, what and where is his evidence? For myself, while I should hesitate to accept the utterances of representative Germans in the present excitement regarding objective facts, I think they are wholly acceptable evidence regarding their own state of mind. And that state of mind is one which naturally expresses itself by appeal to Kant, the categorical imperative, and the traditional idealism of Germany. Does Professor Hocking deny this? If not, what does he make of it?

What I make of it, I repeat, is not that the Germans are conscious hypocrites, but that in a world where men act pragmatically, it is dangerous to entertain a philosophy which is at adds with the facts of action, since such a philosophy will mask from men the real nature of their activities and encourage them to engage in one kind of action feeling that they have the sanction of ideas of a radically different kind. Yet I recognize that in a society organized as is Germany, class stratifications, and an efficiently organized hierarchy of subordinations, give appeal to *a priori* concepts a certain solid backing. "Immutable principles" are but sublimations of the emotions attending the actual organization of society. There is no such intellectual uncertainty and confusion in a German appeal to an absolute philosophy as there is, inevitably, in its American analogue—which to my ear always has a deplorable thinness and unreality.

Let it not be thought that to admit—or rather assert—that German action is pragmatic and experimental is to give away the case. What is at issue is the difference between an activity which is aware of its own character, which knows what it is about, which faces the consequences of its activities and accepts responsibility for them, and an activity which disguises its nature to the collective consciousness by appeal to eternal principles and the eulogistic predicates of pure idealism. Let me close by rewriting a sentence of Professor Hocking's: "Infected by a romantic idealism, the current popular philosophy of Germany justifies measures undertaken because of narrow expediency in the name of eternal principles; it justifies acts devoid of sympathy and humanity on the ground that they are in the interest of an ultimate evolution of humanity possible only through the leadership of a people which appreciates the truth of pure idealism and the meaning of pure duty; it justifies breaking of legal and therefore external and temporary obligations in behalf of an unconditional obligation to fulfill an historic mission as organ of the Absolute."

JOHN DEWEY.

NEW YORK CITY.

MR. ALBERT LEVITT, lecturer in philosophy at Columbia University in 1913–14, has accepted a position at Colgate University for the current academic year.

THE *Bulletin de l'Institut Général Psychologique* prints in its issue for July–December, 1914, an article in three parts by Mlle. Marie Goldsmith, entitled, "Les Réactions Physiologiques et Psychiques des Poissons." In the number for January–June, 1915, the editors have radically departed from their usual subject-matter and have printed a series of exceptionally interesting articles on the war, from the French point of view. M. Émile Boutroux writes on "L'Allemagne et la Guerre"; M. Henri Bergson. "La Signification de la Guerre"; M. Léon Bourgeois and M. Émile Boutroux, "La Guerre et la Vie de Demain"; M. Yves Delage, "'Les grands Hommes d'Ostwald et le Manifeste des 93"; M. Edmond Perrier, "Evolution de l'Erreur Allemande."